

Notice of Allowability

Application No.

10/630,513

Applicant(s)

COHEN ET AL.

Examiner

Art Unit

Alan Diamond

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the response to election/restriction filed March 15, 2005.
2. ☒ The allowed claim(s) is/are 17-19.
3. ☒ The drawings filed on 28 May 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 04012005.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Dennis Smalley on March 31, 2005.

The application has been amended as follows:

In The Specification

On page 1, at the continuity data inserted beginning at line 6, after "January 5, 2001," please insert --now U.S. Patent 6,613,972,--.

Please replace the paragraph at page 5, lines 15-16, with the following paragraph:

--Figs. 15a and 15b illustrate additional process steps in fabricating is a cross section of a portion of a generator including a barrier layer in the thermoelectric elements. Fig. 15c is a cross section of a portion of a generator including a barrier layer in the thermoelectric elements according to an embodiment of the present invention.--

In The Claims

Please cancel claims 1-16 and 20-29.

In claim 17, at line 3, please delete "a central" and insert in its place --an interior central--.

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In claim 17, at line 3, after "region" please insert --for combustion--.

In claim 18, at line 2, please delete "generator" and insert in its place --central region--.

In claim 19, at line 2, after "rotation" and before the period please insert --of the toroidal surface--.

2. The following is an examiner's statement of reasons for allowance: Note that claim 17 now recites that the microscale combustor comprises a counterflow heat exchanger having a generally toroidal exterior surface and defining an interior central region for combustion. An example of this can be seen in instant Figures 1 and 5 wherein the combustor (100) is toroidal and has toroidal exterior surface walls (12) and defines an interior central region (20) for combustion. This distinguishes over a reference such as Perl (U.S. Patent 3,525,325) where the burner (15, 62) is not in an interior central region of the toroidal casing (10) for the heat exchanger (see Figures 1, 2, and 4 of Perl). In other words, as was discussed with Applicant in the attached Examiner Initiated Interview Summary form, the instant claims do not encompass a situation as in Perl where the burner/combustor is in what would be considered to be the doughnut hole part of the toroidal shape. The "interior central region" referred to in instant claim 17 is the interior central region defined by the toroidal exterior surface. The interior central region is inside the toroid as shown for example at reference sign (20) in instant Figure 1A, not at the doughnut hole of the toroid. Perl is even further remote from instant claim 17 because it lacks a teaching that said central region has an internal dimension that is smaller than about 1 millimeter.

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Naylor (U.S. Patent 3,858,646) teaches a toroidal heat exchanger. However, Naylor is not a microscale combustor and lacks the instant central region for combustion. Indeed, a skilled artisan would perform combustion outside of the toroid because Naylor's heat exchanger is to be connected with exhaust gases of an automobile (see col. 6, lines 14-19). Stachurski (U.S. Patent 3,899,359) teaches a thermoelectric generator with counterflow heat exchange. Figures 6 and 7 of Stachurski show a burner (152) with combustion chamber (154). In Stachurski's Figure 7, it would appear that thermoelectric generator section (20) forms a toroid around the combustion chamber (154). Accordingly, Stachurski, like Perl, teaches that the combustor is at the doughnut hole of the toroid, not in the interior of the toroid as in the instant claims.

Martin et al (U.S. Patent 6,282,371), Maruta et al (U.S. Patent 6,840,762), and JP 2-272214 A show "Swiss roll" type heat exchange/combustion devices, which are not generally toroidal. In instant Figure 1A, it is the swirl roll structure that is rotated to form the toroid.

The following two conference proceeding publications are hereby made of record: Sitzki et al, "Combustion in Microscale Heat-Recirculating Burners," The Third Asia-Pacific conference on Combustion, June 24-27, 2001, Seoul, Korea; and Maruta et al, "Catalytic Combustion in Microchannel for MEMS Power Generation," The Third Asia-Pacific conference on Combustion, June 24-27, 2001, Seoul, Korea. These two conference proceeding publications published after the instant January 5, 2001 parent application domestic priority date, and after the January 7, 2000 date of parent provisional application 60/175,154. Instant claims 17-19 are fully supported by said

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provisional application. These later published conference proceedings, which disclose the claimed invention, have authors in common with the instant inventors, but the authorship is different from the instant inventorship. The Examiner does not deem there to be a 102(f) rejection since the two conference proceeding publications published well after the January 7, 2000 priority date, as well as after said January 5, 2001 date. Furthermore, the instant inventor's declaration filed with the instant application sets forth the inventorship.

The following U.S. Patent and Patent Application Publications are hereby made of record: 2,792,200, 3,646,927, 4,382,425, 4,879,959, 4,860,695, 2003/0121791, 2003/0127336, 6,613,972, 2003/0183008, 2003/0221968, 2003/0222738, and 6,786,716.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
Primary Examiner
Art Unit 1753

Alan Diamond
April 1, 2005

A handwritten signature in black ink, appearing to read 'Alan Diamond', with a stylized flourish at the end.